

Kabato Burka

NORTHEASTERN UNIVERSITY · MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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Education

Northeastern University

Boston, MA

MASTERS OF SCIENCE IN ELECTRICAL AND COMPUTER ENGINEERING WITH CONCENTRATION IN POWER SYSTEM

May 2026

GPA: 3.63

Selected coursework: Electric Drives, Electric Vehicles Powertrains, Electromagnetic Devices, Power Electronics, Power Systems Analysis, Power Management Integrated Circuits

Northeastern University

Boston, MA

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

May 2025

GPA: 3.55

Honors: Dean's List, Global Scholar

Study Abroad: Thessaloniki, Greece (Spring 2022)

Coursework: Electronic Design, Integrated Circuit Devices, Calculus I - III, Differential Equations, Physics I-II, Chemistry

Publication

Heat Energy Harnessing via Seebeck Generators

AMERICAN SOCIETY FOR ENGINEERING EDUCATION CONFERENCE

- R. R. Katikaneni, M. Farah, C. M. Martinez, **K. Burka**, T. C. Aniagboso, and B. Maheswaran, "Heat Energy Harnessing via Seebeck Generators," oral presentation, ASEE-NE 2022, Wentworth Institute of Technology, Boston, MA, Apr. 2022, doi: 10.18260/1-2-4217.

Research Experience

Massachusetts Institute of Technology

Boston, MA

TECHNICAL ASSOCIATE

June 2026 - Present

- Principal Investigator: Giovanni Traverso
- Electrical engineering member of the Laboratory for Translational Engineering, designing a minimally invasive ingestible electronic device intended to detect cortisol in high-pressure situations to prevent long-term traumatic events, namely post-traumatic stress disorder
- Delivered 2 platform-integrated printed circuit board designs under the space constraint of a triple-zero (000) pill capsule (23.9 mm × 8.5 mm) and single-cell battery power limits, incorporating DC/DC, RF, and mixed-signal circuitry
- Microfabricated 10+ unique rigid and flexible printed circuit board and electrode designs for swine in-vivo testing
- Performed large animal (swine) device testing and blood handling under animal care protocols approved by MIT Division of Comparative Environment, Health, and Safety liaison for the Building E25 Fabrication Lab, conducting LPKF trainings, waste disposal, and maintenance

Programmable and Reconfigurable Soft Engineered Systems Laboratory (PARSES)

Boston, MA

RESEARCH ASSISTANT

July 2025 - July 2026

- Principal Investigator: Kris Dorsey
- Engineered electronics hardware for a robotic splint prototype with a programmable hinge joint, emphasizing long-arm actuation for soft wearable rehabilitation systems; integrated 2 IMUs and 1 ToF on ESP32 S2 with I2C logging; built a calibration jig to map 0 to 180°
- Co-led mechanical hardware integration, involving creating Fusion360 designs for PLA 3D-printed electronics housing and measurements for the stretchable fabrics made by Professor Megan Hofmann's Accessible Creative Technologies Lab
- Evaluated hinge motion and sensor responsiveness through iterative experimentation, refining control strategies and mechanical adaptability

The George J. Kostas Research Institute at Northeastern University (KRI)

Burlington, MA

RF RESEARCH ENGINEER INTERN

January 2024 - June 2024

- Principal Investigators: James Vedral (Presently Chief Technology Officer at OBSIDIA Semiconductors)
- Validated antenna project designs for the Assured Communications and Electromagnetic Dominance Division
- Fabricated high-frequency RF antennas using Keysight Genesys and Ansys HFSS; utilized LPKF micro-milling and performed SOLT calibration with de-embedding to extract precise S11 and S22 data
- Translated test results into design updates that improved match and bandwidth

Advanced Materials and Microsystems Laboratory (AMML)

Boston, MA

RESEARCH ASSISTANT

January 2024 - April 2024

- Principal Investigator: Nian Xiang Sun (Presently on Leave of Absence for Industry)
- Prototyped a 4-point measurement resistive circuit to detect a 5mΩ change from a breath-based SARS-CoV-2 detecting glucose aerosol sensor
- Tested a low-power design to capture and differentiate respiratory resistivity signatures
- Validated sensor performance and explored applications in non-invasive diagnostics

Industry Experience

Renesas Electronics Corporation

Boston, MA

ASSOCIATE ENGINEER

January 2025 - June 2026

- Delivered schematic and system-level design guidance to accelerate product adoption with Renesas Power and Analog legacy and newly generated parts for consumer and industrial electronics applications in New England
- Contributed 7.5% to the New England Region's 2025 \$70,000,000 design-in goal
- Presented in monthly distributor meetings for regional branches to generate awareness of potential solutions for over 100+ customers
- Provided consultations, application guidance, and on-site engineering support for 20+ customer opportunities on Programmable Mixed-Signal GreenPAK™, Discrete GaN, Inductive Position Sensing, and other Analog/Power products
- Performed design reviews, root-cause analysis, and hands-on debug on 30+ analog and power issues, resolving most within [1 week]
- Led power architecture development for 20+ customer designs, including power tree design, device selection, and system optimization.
- Collaborated with sales and product engineering teams to resolve technical challenges and align solutions

Fleet Robotics

Somerville, MA

ROBOTICS TEST ENGINEER INTERN

September 2024 - December 2024

- Researched and recorded the magnetic behavior of custom electropermanent magnets for two underwater hull-cleaning robot prototypes to ensure reliable and consistent adhesion in harsh conditions
- Analyzed Shimadzu Autograph and energy usage data from Raspberry Pi Pico 2 automated test fixtures to determine the magnetic strength and optimization of driver circuits for magnetic coil excitation
- Informed design improvements based on magnetic field characterization and system response of 3 new magnet prototypes

Amazon

Boston, MA

HARDWARE DEVELOPMENT ENGINEER INTERN

June 2024 - September 2024

- Directed Failure Modes and Effects Analysis for the 20lb Universal Item Sorter system across NA and EU/UK, establishing and monitoring KPIs to drive asset cost reduction for Amazon Reliability Maintenance Engineering
- Examined the use case and development of systems along with their sub-components at traveled sites in NA
- Consulted with key stakeholders to align project objectives and drive successful outcomes of asset reliability

SharkNinja

Needham, MA

ELECTRICAL DESIGN ENGINEER INTERN

July 2023 - December 2023

- Collaborated with senior members in designing analog circuits and development of novel concepts for next-generation cordless vacuum; contributed to 10+ schematic projects and 4 PCB spins, enabling 3 EVT/DVT prototypes
- Performed design, debugging, and board bring-up of analog real-time embedded electronics
- Led PCBA reworks on of field products and analyzed consumer-reported issues with EE, PD, FW, and SW teams

Teaching

EECE 5684: Power Electronics

Boston, MA

TEACHING ASSISTANT

January 2026 - April 2026

- Course Instructor: Prof. Brad Lehman
- Facilitate weekly lab sessions covering buck, boost, buck-boost, and forward converter design and testing using standard laboratory equipment, while guiding students on circuit operation, measurement techniques, and safe use of power electronics hardware
- Document lab availability, equipment status, and usability of test instruments, maintaining organized records so students have access to functioning oscilloscopes, power supplies, and other essential resources
- Partnered with Professor Arijit Banerjee at the University of Illinois Urbana-Champaign, focused on developing low-cost power electronics lab kits, contributing to a range of hands-on experiments possible for power electronics coursework and assisting with broader education and outreach efforts for the IEEE Power Electronics Society

EECE 2150: Circuits and Signals: Biomedical Applications

Boston, MA

TEACHING ASSISTANT

September 2025 - December 2025

- Course Instructor: Prof. Iman Salama and Prof. Nicol McGruer
- Lead two lab sections for understanding the application of passive components and introduction of active components such as Operational Amplifiers, Instrumentation Amplifiers, and Light Emitting Diodes
- Graded assignments of weekly homework and quizzes for over 50 students
- Supported students with hosted weekly office hours to discuss elements of class that students would like to discuss

EECE 5693: Electromagnetic Devices for RF and Wireless Communications

Boston, MA

TEACHING ASSISTANT

June 2025 - July 2025

- Course Instructor: Prof. Hossein Mosallaei
- Instructed sessions on Ansys HFSS, teaching students how to simulate and design transmission lines and antenna configurations
- Supported 14 graduate-level students in understanding wave propagation, S-parameters, and impedance matching through lab assistance
- Assisted during lab sessions by answering technical questions, troubleshooting simulation issues, and reinforcing course material through hands-on guidance

University Leadership

Northeastern University Housing and Residential Life

Boston, MA

RESIDENT ASSISTANT

August 2022 - August 2026

- Planned, budgeted, and executed monthly events for 150+ undergraduates, fostering a sense of community
- Completed biannual leadership training on maintaining student safety and well-being as well as conflict control
- Served as a peer resource by addressing resident concerns, sharing campus support services, and promoting inclusive living environments in Northeastern's Residential Living of 10 Coventry, 60 Belvedere, East Village, and Willis Hall

Black Engineering Student Society

Boston, MA

ALUMNI RELATIONS CHAIR

June 2024 - April 2025

- Advisor: Dean Richard Harris
- Liaison connecting active collegiate members of Northeastern's chapter of the National Society of Black Engineers with alumni dating as far back as 1974, in order to build academic excellence, professionalism, and community impact between generations of members
- Organized 4 alumni panels across the academic year and built the foundational structure of the alumni and student mentorship program that is currently active in the organization
- Created alumni membership tiers and decade representatives from the 1970s to the 2020s for the organization's 50th anniversary records
- Engaged with alumni through external events outside the organization and at national and regional annual conferences to grow alumni membership and support student development

Skills

TECHNICAL SKILLS: HARDWARE

- **Hardware Laboratory Tools:** Multimeter, Oscilloscope, Signal Generator, Soldering Iron (Through-hole and Surface Mount), Vector Network Analyzer, Spectrum Analyzer, Bench Power Supply, LCR meter, Logic Analyzer, Reflow Oven, LPKF ProtoLaser R4, LPKF ProtoLaser U4
- **Hardware Design Tools:** Altium, Ansys HFSS, Fusion 360, Keysight Genesys, KiCAD, LTspice, PLECS, OrCAD, Cadence Virtuoso
- **Components:** Digital logic, transistors, op-amps, and passive components.

TECHNICAL SKILLS: SOFTWARE

- **Programming:** C++, MATLAB, Mathematica, Python, LaTeX
- **Software Tools:** Adobe Suite, Asana, Git, Jira, Google Workspace, Microsoft 365, Slack, Windows, Linux, UNIX, Visual Studio Code

TECHNICAL SKILLS: BIOLOGY

- **In Vivo:** Swine handling, mouse handling, blood collection, ingestible device deployment
- **In Vitro:** Adobe Suite, Asana, Git, Jira, Google Workspace, Microsoft 365, Slack, Windows, Linux, UNIX, Visual Studio Code
- **Compliance:** IACUC protocols, AALAS training, Adult and Pediatric CPR/AED certified, biological waste handling

Professional Affiliations

Institute of Electrical and Electronics Engineers Medicine and Biology Society

MEMBER SINCE 2026

Institute of Electrical and Electronics Engineers Power Electronics Society

MEMBER SINCE 2024

Institute of Electrical and Electronics Engineers

MEMBER SINCE 2024

National Society of Black Engineers

MEMBER SINCE 2021